October, 1929 Extension Circular No. 174

CONTROL OF TOBACCO INSECTS

EXAMINING TOBACCO FOR BUD WORM INJURY

NORTH CAROLINA STATE COLLEGE OF AGRICULTURE AND ENGINEERING
AND
U. S. DEPARTMENT OF AGRICULTURE, CO-OPERATING
N. C. AGRICULTURAL EXTENSION SERVICE
I. O. SCHAUB, *Director*
STATE COLLEGE STATION
RALEIGH

UNIVERSITY OF ARIZONA LIBRARY

DISTRIBUTED IN FURTHERANCE OF THE ACTS OF CONGRESS OF MAY 8 AND JUNE 30, 1914

CONTROL OF TOBACCO INSECTS

By C. H. Brannon, *Extension Entomologist*

INTRODUCTION

Tobacco growers in North Carolina are only too familiar with the various insect pests of tobacco which cause a loss of many thousands of dollars in the State each year. The control measures advised in this circular have proved effective and practical, and tobacco growers are urged to put them into practice as a protection against insect damage.

FLEA-BEETLE OR FLEA "BUG"

The flea-beetle feeds on tobacco from the time it first comes up in the bed until heat in the curing barn either runs them out or kills them. They feed mostly on the top side of the leaves in the plant bed and on the lower side of the leaves in the field. The adult tobacco flea-beetle (or flea bug) is only about 1/15-inch in length and usually escapes notice until present in very destructive numbers. The damage caused by the adult beetles feeding on the leaves of the plant is only part of the damage. The larva or "worm," which turns into a flea-beetle, feeds upon the roots of the tobacco plant and causes serious damage to the growing plant.

Control in Plant Bed

We cannot emphasize too strongly the importance of control in the plant bed. Later in the field they are more difficult to control.

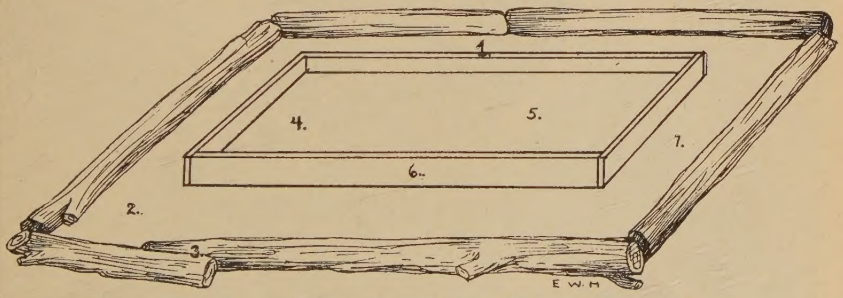


Diagram of Trap Bed

1. New cloth tacked on with wooden laths. 2. Old cloth. 3. Poles. 4. Tight bed. 5. New cloth; 25 strands to inch. 6. Sawed planks. 7. Trap.

The *trap bed* has given excellent results in the control of the flea-beetle and its method of construction is shown in the accompanying diagram. *Boards* should be used around the margin of the bed. (Poles should not be used as they cannot be made tight.) Soil should be banked around the boards so that the insects cannot crawl under them. (If a drain is necessary the opening should be covered with fine wire and cheese cloth placed over it.) The boards should be fitted closely at the corners. Obtain cheese cloth (or canvas) having *25 strands to the inch.* Only new cheese cloth should be used over the bed; it should be well sewn and fastened to the margin boards by wooden strips. Tacking or nailing the cloth to the boards without the strip will usually result in holes pulled in the cloth.

An area of at least two feet around the tight bed should be sown in tobacco as the trap. Use poles for the margin of the trap. The plants in the trap should be kept well covered with poison all the time.

As a poison use the "1 in 6" mixture, which is:

Paris Green	1 Pound
Arsenate of Lead	5 Pounds

Apply at the rate of ½ pound "1 in 6" mixture to 100 square yards.

If the tight bed and trap is well-constructed it will only be necessary to poison the trap. Where no trap is used the bed must be poisoned. Remove cloth to make application and poison beds carefully. In poisoning traps the only care necessary is not to burn the plants.

The plants in the trap are not to be used. Make the bed as large as it is to be made and add the trap to the outside.

FLEA-BEETLE DAMAGE TO TOBACCO
(Courtesy U. S. Bureau of Entomology)

Tobacco growers will find the tight bed and trap an excellent place for the plants, even though no flea-beetle were present. Where flea-beetles are causing damage, growers cannot afford to be without this protection to the bed.

If a liquid spray is preferred, use:

"1 in 6" mixture	1½ to 2 Pounds
Water	50 Gallons

SMALL QUANTITY

"1 in 6" mixture	1½ to 2 Tablespoonsful
Water	3 Gallons

Field Control

For flea-beetle control in the field—

For newly set plants use:

"1 in 6" mixture 3 Pounds per Acre

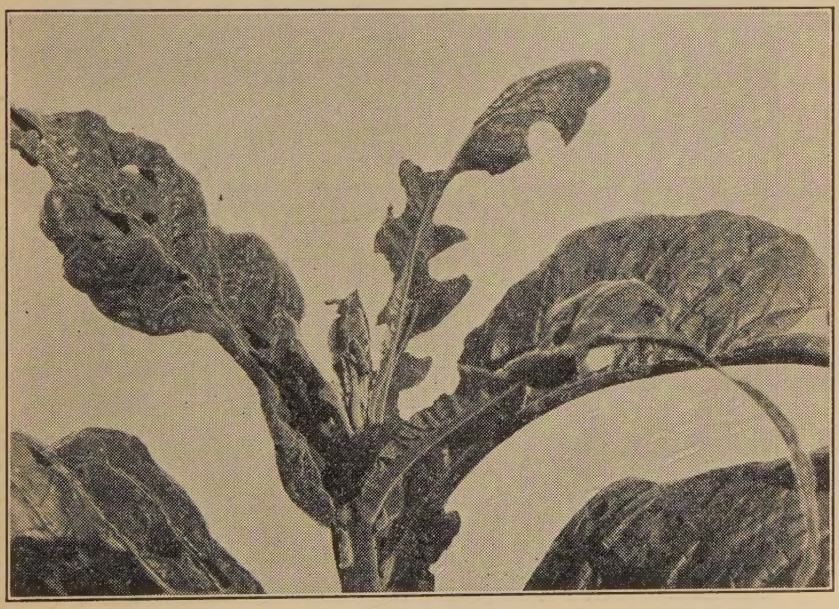
For tobacco half-grown or larger, use:

"1 in 6" mixture 4 to 6 Pounds per Acre

This will control horn worms also.

Due to the dense growth of tobacco and the necessity of applying the poison on the under side of the leaf, tobacco can best be poisoned in the field by dusting.

IMPORTANT: The "1 in 6" mixture has been found to control the flea-beetle better than any other mixture. Do not substitute calcium arsenate or any other material for Paris green and arsenate of lead.



TYPICAL BUD WORM DAMAGE
(Courtesy U. S. Bureau of Entomology)

BUD WORM

Tobacco bud worm damage is caused by the corn ear worm. The best known control is the poisoned corn meal bait which is as follows:

LARGE AMOUNT

Arsenate of Lead	1 Pound
Corn Meal	50 Pounds

SMALL AMOUNT

Arsenate of Lead ..... 6 heaping tablespoonsful
Corn Meal ..... 1 Peck

Carefully mix the poison throughout the corn meal. The meal should not contain coarse husk.

Rate of application:

1 peck or 12 pounds (corn meal—arsenate of lead mixture) per acre.

Make applications early in morning when tobacco bud is open. A small pinch of poison should be dropped into *center of bud.* Applications carelessly made are of no value. Best results will be secured by placing the bait directly in the tip of the plant.

BUD WORM DAMAGE AS IT SHOWS ON CURED TOBACCO IN COMPARISON WITH NON-INJURED LEAF
(Courtesy U. S. Bureau of Entomology)

Applications should be begun ten days or two weeks after the plants are set in the field and should be repeated every week or ten days until the plants are topped.

It is very important to begin applications early. Many growers delay applications until serious injury is noticed.

IMPORTANT: The bud worm prefers corn to tobacco; do not substitute any other material for the corn meal. Use only arsenate of lead for the poison.

HORN WORMS

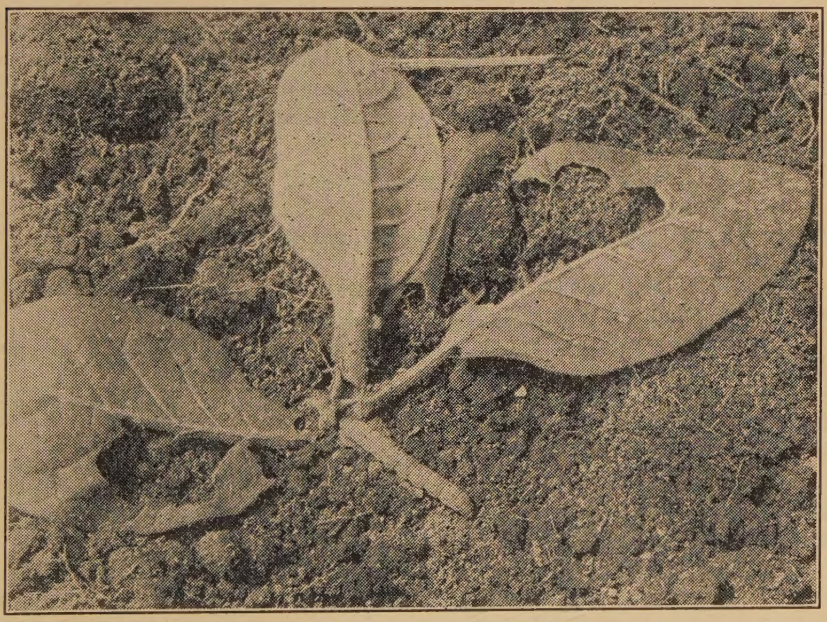
The "1 in 6" mixture is a most excellent horn worm poison. It should be used in the same amounts as for flea-beetle control. If the "1 in 6" mixture is being applied for flea-beetle the horn worms will be killed at the same time.

Arsenate of lead can be applied as a dust as follows:

Arsenate of Lead	4 to 5 lbs. per Acre

This poison will not control the flea-beetle.

CAUTION: Use only the poisons advised. Do not substitute any other material for those recommended.



TOBACCO CUT WORM DAMAGE
(Courtesy U. S. Bureau of Entomology)

CUTWORMS

The following bait has given excellent results:

Wheat Bran	50 Pounds
Paris Green	1 Pound
Water	Enough to moisten

In case Paris green cannot be obtained, sodium flouride will give good results at the same dosage. Lead arsenate and calcium arsenate do not give good results as cutworm poisons and should not be used.

How to Mix

The bran and poison should first be thoroughly mixed in a tub or other vessel while dry and should then be gradually moistened with water and again thoroughly mixed so that all the bran is damp. The bran should be wet enough to crumble readily after being squeezed in the hand. The bait should not be sticky and by no means should it be a soft mush.

The hands are the best instruments for doing the mixing, although a paddle may be used. Do not breathe any more of the poison than possible in mixing and the hands and arms should be frequently washed with a portion of the water used to moisten the bran.

Amount of Bait to Apply

The bait should be broadcast late in afternoon at the rate of:

15 to 20 pounds (dry weight) per acre.

It is best to apply the bait several days before the plants are set, or the same day at the latest. In making applications after the plants are set out, the bait should not be thrown upon the plants or against the stems.

The bait will be effective for several days but should be repeated at once after a heavy rain.

CAUTION: *Do not allow poultry in poisoned field.*

WIREWORM (OR PITHWORM)

There is no way known to poison the wireworm (or pithworm) due to its habit of feeding beneath the ground and inside the stem.

Where wireworms are known to cause damage, tobacco should not be followed after corn, grass or sod.

Late fall plowing aids in control by causing many of the insects to be killed by cold weather.

NOTE: There is an insect called the common stalk borer which bores into tobacco stalks. This larva or "worm" is more active and larger than the wireworm. Control consists in cleaning up weeds around the border of fields which harbor this pest.

GRASSHOPPERS

The following mixture should be used to poison grasshoppers:

Wheat Bran	50 Pounds
Paris Green	2 Pounds
Amyl Acetate	1½ Ounces
Molasses (black strap)	1 Gallon
Water	Enough to moisten thoroughly
	(Do not make a sloppy mixture.)

How to Mix

Thoroughly mix the bran and Paris green while dry. Add sufficient water to the molasses so that the molasses can be easily poured. Add the amyl acetate to the water and molasses. Then pour the molasses-water-

amyl acetate mixture on the bran-Paris green mixture. Mix well and add enough water to thoroughly moisten. Do not make a sloppy mixture.

How to Apply

Broadcast the poison bait *early in the morning* at the rate of 10 to 15 pounds per acre.

Apply bait in furrow if crop is growing in field to be poisoned. Do not distribute bait close to fruit trees. Keep poultry out of poisoned fields. The bait will be effective for several days but should be repeated at once after a heavy rain.

IMPORTANT: The amyl acetate can be obtained from drug stores, or 6 to 8 finely chopped oranges or lemons can be substituted for the amyl acetate in the bait.

WHITE GRUBS

White grubs often cause very severe damage to plant beds. The following bait has given good results:

Wheat Bran	25 Pounds
Paris Green	1 Pound
Water	Enough to moisten

Broadcast at the rate of 10 to 12 pounds (dry weight) to each 100 square yards of plant bed. Do not allow excessive amount of bait to fall on plants. Broadcast evenly.

SLUGS AND SNAILS

Slugs and snails have caused severe injury to plant beds in the State. These pests can be satisfactorily controlled by using the bait mentioned for *White Grubs*. The bait should be mixed and applied in the same way as for white grubs. Several applications may be necessary. (Slugs are snails without shells.)

NEMATODES OR ROOT-KNOT

Nematodes can only be controlled by growing some crop on the land (for at least three successive years) which nematodes do not attack. The writer will gladly send a circular on nematode control which lists the plants not attacked by this pest. All who are interested are invited to write for the nematode circular.

CIGARETTE BEETLE

This insect causes damage to tobacco which is stored in pack houses, warehouses and manufacturing plants. Manufactured tobacco is frequently attacked. The cigarette beetle eats out small holes through the tobacco. This pest is often known as the tobacco beetle, tobacco "weevil," etc. Pack houses should be thoroughly cleaned immediately after grading is finished.

Cigarette beetle damage is often confused with flea-beetle damage.

Detailed information will be sent upon request to the writer.

OTHER METHODS OF CONTROL

The following control measures are just as important as poisoning and will yield sure results. Do not neglect the following methods of control.

TRAP BED WITH COVER REMOVED. LOWER PART OF TRAP IS LEFT UNCOVERED FOR CHECK. UPPER PART POISONED. NOTICE THE DIFFERENCE IN THE PLANTS.

Destroy Plant Bed

The plant bed should be plowed up and all plants killed immediately after use of the bed. Thousands of insect pests breed up on plants which are allowed to grow up in the bed after use. These pests rapidly spread to the tobacco in the field.

Do Not Allow Stalks to Stand in Field After Harvest

Stalks which are allowed to stand in the field after harvest furnish a large supply of insect pests to attack the tobacco next season.

The stalks should either be plowed under or cut immediately after harvesting. Green tobacco stalks plowed under are beneficial to the soil. Suckers which grow up on stalks left standing, furnish a breeding ground for millions of insect pests which will attack the crop the next season.

We cannot emphasize too strongly the necessity of destroying the plant bed *immediately after use* and the plowing under or cutting of stalks in the field *immediately after harvest.*

POISON MACHINES

A *good* machine is necessary for field control of flea-beetles and horn worms. Tobacco growers will find that a suitable machine will give excellent results. Poison for the above mentioned pests cannot be applied properly without a machine.

There are several types of machines on the market:

Hand duster—satisfactory for small acreage.

Saddle-back duster—suitable for growers having as much as 10 acres.

2-row mule-drawn duster—suitable for growers having 15 to 25 acres or more.

3-row cart duster—satisfactory for growers having large acreage.

The above type machines are in use on cotton. Growers having both cotton and tobacco can use the same machine on both crops.

Important: Do not buy a worthless machine. There are excellent machines on the market. See your county agent or write to the Extension Entomologist, State College Station, Raleigh, for information about good machines.

The dust method of application on tobacco in the field is much preferable to spraying.